CLAIMS

1. Laser cavity with controlled polarization containing a substrate made of a doped or undoped active laser material $Y_3Al_5O_{12}$ (YAG) on which a monocrystalline layer of saturable absorbent material made of doped YAG is deposited directly by liquid phase epitaxy or by a similar process, in which the said active laser material has a [100] orientation, and the said monocrystalline layer of saturable absorbent material is deposited with the same [100] orientation.

2. Laser cavity according to claim 1, in which the said monocrystalline layer of doped saturable absorbent material is obtained by liquid phase epitaxy (LPE).

3. Laser cavity according to either of claims 1 or 2, in which the substrate is a YAG active laser material, doped by one or several doping ion(s) that confer active laser material properties on it, and for example chosen among the Nd, Cr, Er, Yb, Ho, Tm, and Ce ions.

4. Cavity according to claim 3, in which the doping ion is neodymium (Nd).

5. Cavity according to either of claims 3 or 4, in which the proportion of the doping ion(s) is 0.1 to 10 moles % for each ion.

6. Laser cavity according to any one of claims 1 to 5 in which the monocrystalline layer of a saturable absorbent material is a YAG doped with one or several doping ions chosen among Chromium (Cr), Erbium (Er), Thulium (Tm), and Holmium (HO) ions.

7. Laser cavity according to claim 6, in which the said doping ion is Chromium.

8. Laser cavity according to either of claims 6 or 7, in which the proportion of the doping ion(s) is 1 to 10 moles % for each doping ion.

9. Cavity according to any one of claims 1 to 8 in which the layer and/or the substrate are (also) doped with at least one (other) doping agent or substitute in order to modify their structural and/or optical properties.

10. Cavity according to claim 9, in which the said (other) doping ion is chosen among gallium and inactive rare earths.

11. Cavity according to any one of claims 1 to 10, in which the thickness of the monocrystalline layer of saturable absorbent material is between 1 and 500 µm.

12. Cavity according to claim 10, in which the said monocrystalline layer of saturable absorbent material is a thin layer with a thickness of between 1 and 150 µm.

13. Laser cavity according to any one of claims 1 to 12, which also comprises an entry mirror and an exit mirror, the said entry mirror being directly deposited on the substrate made of an active laser material.

14. Laser cavity according to claim 12, in which the exit mirror is directly deposited on the

monocrystalline layer made of a saturable absorbent material.

15. Process for the collective manufacture of triggered microlaser cavities with controlled polarization comprising the following steps:

- a substrate made of a doped or undoped $Y_3Al_5O_{12}$ (YAG) active laser material with a [100] orientation is supplied in the shape of a sheet with parallel faces polished on its two faces;
- a monocrystalline layer of doped YAG saturable absorbent material is deposited on one of the faces of the said $Y_3Al_5O_{12}$ (YAG) active laser material, by liquid phase epitaxy or by a similar process;
- the saturable absorbent monocrystalline layer thus deposited is polished;
- the entry and exit mirrors are deposited on the two polished faces of the cavity;
- the substrate - monocrystalline layer - mirrors complex thus obtained is cut out.

16. Triggered laser with controlled polarization comprising a cavity like the cavity according to any one of claims 1 to 14, and pumping means for this cavity.

add a'